What is claimed is:

1. A lens barrel comprising:

a stationary member;

a rotary input shaft which is rotatably supported by said stationary member to extend parallel to an optical axis, and includes an orthogonal surface lying in a plane orthogonal to an axis of the rotary input shaft;

a manual operating ring which is rotatably supported by said stationary member, and is rotated by a rotation of said rotary input shaft via a gear mechanism;

at least one optical element which is movable along the optical axis by a rotation of said manual operating ring;

a hollow-cylindrical output gear having a cylindrical inner peripheral surface in which said rotary input shaft is fitted so that said hollow-cylindrical output gear can freely rotate on said rotary input shaft, and an outer gear portion which is formed on an outer peripheral surface of said hollow-cylindrical output gear to be concentric with the cylindrical inner peripheral surface, the outer gear portion serving as a part of said gear mechanism;

a non-circular cross section portion formed on said rotary input shaft to be adjacent to said orthogonal

surface to form at least one accommodation space between said rotary input shaft and said cylindrical inner peripheral surface;

at least one ball installed in said accommodation space; and

a biasing device for making said orthogonal surface and said ball come into pressing contact with each other,

wherein said non-circular cross section portion is shaped so that said rotation of said rotary input shaft is transferred to said hollow-cylindrical output gear via said ball, to which said rotation of said rotary input shaft is given via said orthogonal surface, when said rotary input shaft is driven to rotate.

2. The lens barrel according to claim 1, wherein said stationary member comprises a stationary ring.

3. The lens barrel according to claim 1, wherein said optical element is moved by one of a rotation of said manual operating ring when said manual operating ring is manually rotated and a rotation of said manual operating ring when said manual operating ring is rotated by said rotation of said rotary input shaft via said gear mechanism.

4. The lens barrel according to claim 1, wherein said non-circular cross section portion includes at least one surface which is orthogonal to a radial direction of

said rotary input shaft.

5. The lens barrel according to claim 4, wherein the shape of said non-circular cross section portion is a polygon in cross section.

6. The lens barrel according to claim 1, wherein said non-circular cross section portion includes at least one pair of inclined surfaces which are symmetrical with respect to a line extending in a radial direction of said rotary input shaft.

7. The lens barrel according to claim 1, wherein said manual operating ring includes a focusing ring, said lens group being moved along said optical axis to perform a focusing operation when said focusing ring is manually rotated.

8. The lens barrel according to claim 1, wherein said manual operating ring includes a zoom ring, said lens group being moved along said optical axis to perform a zooming operation when said zoom ring is manually rotated.

9. The lens barrel according to claim 1, wherein the shape of said non-circular cross section portion is a square in cross section.

10. The lens barrel according to claim 1, wherein the shape of said non-circular cross section portion is triangular in cross section.

11. The lens barrel according to claim 1, wherein said lens barrel comprises an interchangeable lens barrel which is detachably attached to a camera body.

12. The lens barrel according to claim 11, wherein said rotary input shaft is driven by a drive system provided in said camera body.

13. The lens barrel according to claim 1, wherein said gear mechanism comprises an inner circumferential gear formed on an inner peripheral surface of said manual operating ring.

14. The lens barrel according to claim 1, wherein said biasing device comprises a compression coil spring fitted on said rotary input shaft.

15. A lens barrel comprising:

a stationary member;

a rotary input shaft which is rotatably supported by said stationary member to extend parallel to an optical axis, and includes a first orthogonal surface lying in a plane orthogonal to an axis of said rotary input shaft;

a manual operating ring which is rotatably supported by said stationary member, and is rotated by a rotation of said rotary input shaft via a gearing mechanism;

at least one optical element which is movable along

said optical axis by a rotation of said manual operating ring;

a hollow-cylindrical output gear having a cylindrical inner peripheral surface in which said rotary input shaft is fitted so that said hollow-cylindrical output gear can freely rotate on said rotary input shaft, and an outer gear portion which is formed on an outer peripheral surface of said hollow-cylindrical output gear to be concentric with said cylindrical inner peripheral surface, said outer gear portion serving as a part of said gear mechanism;

a second orthogonal surface formed on a support portion of said stationary member to lie in a plane orthogonal to said axis of said rotary input shaft and to face said first orthogonal surface, said support portion supporting said rotary input shaft so that said rotary input shaft can freely rotate on said axis thereof;

a non-circular cross section portion formed on said rotary input shaft between said first orthogonal surface and said second orthogonal surface to form at least one accommodation space between said rotary input shaft and said cylindrical inner peripheral surface;

at least one ball installed in said accommodation space; and

a biasing device which biases said rotary input

shaft in a direction along said axis thereof to reduce a space between said first orthogonal surface and said second orthogonal surface so that said ball are held tight between said first orthogonal surface and said second orthogonal surface,

wherein said non-circular cross section portion is shaped so that said rotation of said rotary input shaft is transferred to said hollow-cylindrical output gear via said ball, to which said rotation of said rotary input shaft is given via said first orthogonal surface, when said rotary input shaft is driven to rotate.

16. The lens barrel according to claim 15, wherein said stationary member comprises a stationary ring.

17. The lens barrel according to claim 15, wherein said optical element is moved by one of a rotation of said manual operating ring when said manual operating ring is manually rotated and a rotation of said manual operating ring when said manual operating ring is rotated by said rotation of said rotary input shaft via said gear mechanism.

18. The lens barrel according to claim 15, wherein said non-circular cross section portion includes at least one surface which is orthogonal to a radial direction of said rotary input shaft.

19. The lens barrel according to claim 18, wherein

the shape of said non-circular cross section portion is a polygon in cross section.

20. The lens barrel according to claim 15, wherein said non-circular cross section portion includes at least one pair of inclined surfaces which are symmetrical with respect to a line extending in a radial direction of said rotary input shaft.

21. The lens barrel according to claim 15, wherein said manual operating ring includes a focusing ring, said lens group being moved along said optical axis to perform a focusing operation when said focusing ring is manually rotated.

22. The lens barrel according to claim 15, wherein said manual operating ring includes a zoom ring, said lens group being moved along said optical axis to perform a zooming operation when said zoom ring is manually rotated.

23. The lens barrel according to claim 15, wherein the shape of said non-circular cross section portion is a square in cross section.

24. The lens barrel according to claim 15, wherein the shape of said non-circular cross section portion is triangular in cross section.

25. The lens barrel according to claim 15, wherein said lens barrel comprises an interchangeable lens barrel

which is detachably attached to a camera body.

26. The lens barrel according to claim 25, wherein said rotary input shaft is driven by a drive system provided in said camera body.

27. The lens barrel according to claim 15, wherein said gear mechanism comprises an inner circumferential gear formed on an inner peripheral surface of said manual operating ring.

28. The lens barrel according to claim 15, wherein said biasing device comprises a compression coil spring fitted on said rotary input shaft.

29. A lens barrel comprising:

a stationary member;

at least one optical element guided along an optical axis;

a manual operating ring which is rotatably supported by said stationary member;

a drive ring which is rotatably supported by said stationary member, a rotation of said drive ring causing said optical element to move along said optical axis;

a first rotary input shaft which is rotatably supported by said stationary member to extend parallel to said optical axis, and is rotated by a driving force received from a drive system of a camera body;

a first hollow-cylindrical output gear which is

rotatably fitted on said first rotary input shaft, said first hollow-cylindrical output gear including a first outer gear portion formed on an outer peripheral surface of said first hollow-cylindrical output gear to be engaged with at least one drive-ring rotating gear for rotating said drive ring;

a second rotary input shaft which is rotatably supported by said stationary member to extend parallel to said optical axis;

a second hollow-cylindrical output gear which is rotatably fitted on said second rotary input shaft, said second hollow-cylindrical output gear including a second outer gear portion formed on an outer peripheral surface of said second hollow-cylindrical output gear to be engaged with said drive-ring rotating gear;

a third outer gear portion formed on said second rotary input shaft to be engaged with said drive-ring rotating gear, said second rotary input shaft being rotated via said third outer gear potion and said drive-ring rotating gear when said manual operating ring is manually rotated;

a first one-way rotational transfer mechanism which allows rotation of said first rotary input shaft to be transferred to said first hollow-cylindrical output gear while preventing rotation of said first hollow-

cylindrical output gear to be transferred to said first rotary input shaft; and

a second one-way rotational transfer mechanism which allows rotation of said second rotary input shaft to be transferred to said second hollow-cylindrical output gear while preventing rotation of said second hollow-cylindrical output gear to be transferred to said second rotary input shaft.

30. The lens barrel according to claim 29, wherein said stationary member comprises a stationary ring.

31. The lens barrel according to claim 29, wherein said first one-way rotational transfer mechanism comprises:

a first orthogonal surface formed on said first rotary input shaft to lie in a plane orthogonal to an axis of said first rotary input shaft;

a first cylindrical inner peripheral surface formed on said first hollow-cylindrical output gear so that said first rotary input shaft is fitted in said first cylindrical inner peripheral surface to be freely rotatable relative to said first hollow-cylindrical output gear;

a first non-circular cross section portion formed on said first rotary input shaft to be adjacent to said first orthogonal surface to form at least one first

accommodation space between said first rotary input shaft and said first cylindrical inner peripheral surface;

at least one first ball installed in said first accommodation space; and

a first biasing device for making said first orthogonal surface and said first ball come into pressing contact with each other,

wherein said first non-circular cross section portion is shaped so that said rotation of said first rotary input shaft is transferred to said first hollow-cylindrical output gear via said first ball to which said rotation of said first rotary input is given from said first orthogonal surface when said first rotary input shaft is driven to rotate,

wherein said second one-way rotational transfer mechanism comprises:

a second orthogonal surface formed on said second rotary input shaft to lie in a plane orthogonal to an axis of said second rotary input shaft;

a second cylindrical inner peripheral surface formed on said second hollow-cylindrical output gear so that said second rotary input shaft is fitted in said second cylindrical inner peripheral surface to be freely rotatable relative to said second hollow-cylindrical output gear;

a second non-circular cross section portion formed on said second rotary input shaft to be adjacent to said second orthogonal surface to form at least one second accommodation space between said second rotary input shaft and said second cylindrical inner peripheral surface;

at least one second ball installed in said second accommodation space; and

a second biasing device for making said second orthogonal surface and said second ball come into pressing contact with each other,

wherein said second non-circular cross section portion is shaped so that said rotation of said second rotary input shaft is transferred to said second hollow-cylindrical output gear via said second ball to which said rotation of said second rotary input is given from said second orthogonal surface when said second rotary input shaft is driven to rotate.

32. The lens barrel according to claim 29, wherein said first one-way rotational transfer mechanism comprises:

a first orthogonal surface formed on said first rotary input shaft to lie in a plane orthogonal to an axis of said first rotary input shaft;

a first cylindrical inner peripheral surface formed

on said first hollow-cylindrical output gear so that said first rotary input shaft is fitted in said first cylindrical inner peripheral surface to be freely rotatable relative to said first hollow-cylindrical output gear;

a second orthogonal surface formed on a support portion of said stationary member to lie in a plane orthogonal to said axis of said first rotary input shaft and to face said first orthogonal surface, said support portion supporting said first rotary input shaft so that said first rotary input shaft can freely rotate on said axis thereof;

a first non-circular cross section portion formed on said first rotary input shaft between said first orthogonal surface and said second orthogonal surface to form at least one first accommodation space between said first rotary input shaft and said first cylindrical inner peripheral surface;

at least one first ball installed in said first accommodation space; and

a first biasing device which biases said first rotary input shaft in a direction along said axis thereof to reduce a space between said first orthogonal surface and said second orthogonal surface so that said first ball are held tight between said first orthogonal surface

and said second orthogonal surface,

wherein said first non-circular cross section portion is shaped so that said rotation of said first rotary input shaft is transferred to said first hollow-cylindrical output gear via said first ball to which said rotation of said first rotary input is given from said first orthogonal surface when said first rotary input shaft is driven to rotate,

wherein said second one-way rotational transfer mechanism comprises:

a third orthogonal surface formed on said second rotary input shaft to lie in a plane orthogonal to an axis of said second rotary input shaft;

a second cylindrical inner peripheral surface formed on said second hollow-cylindrical output gear so that said second rotary input shaft is fitted in said second cylindrical inner peripheral surface to be freely rotatable relative to said second hollow-cylindrical output gear;

a fourth orthogonal surface formed on said support portion of said stationary member to lie in a plane orthogonal to said axis of said second rotary input shaft and to face said third orthogonal surface, said support portion supporting said second rotary input shaft so that said second rotary input shaft can freely rotate on said

axis thereof;

a second non-circular cross section portion formed on said second rotary input shaft between said third orthogonal surface and said fourth orthogonal surface to form at least one second accommodation space between said second rotary input shaft and said second cylindrical inner peripheral surface;

at least one second ball installed in said second accommodation space; and

a second biasing device which biases said second rotary input shaft in a direction along said axis thereof to reduce a space between said third orthogonal surface and said fourth orthogonal surface so that said second ball are held tight between said third orthogonal surface and said fourth orthogonal surface,

wherein said second non-circular cross section portion is shaped so that said rotation of said second rotary input shaft is transferred to said second hollow-cylindrical output gear via said second ball to which said rotation of said second rotary input is given from said third orthogonal surface when said second rotary input shaft is driven to rotate.

33. The lens barrel according to claim 32, wherein said first orthogonal surface and said second orthogonal surface lie in a common surface of said support portion.

34. The lens barrel according to claim 31, wherein said first non-circular cross section portion includes at least one first surface orthogonal to a radial direction of said first rotary input shaft, and

wherein said second non-circular cross section portion includes at least one second surface orthogonal to a radial direction of said second rotary input shaft.

35. The lens barrel according to claim 34, wherein each of said first non-circular cross section portion and said second non-circular cross section portion is in the shape of a polygon in cross section.

36. The lens barrel according to claim 31, wherein said first non-circular cross section portion includes at least one first pair of inclined surfaces which are symmetrical with respect to a line extending in a radial direction of said first rotary input shaft, and

wherein said second non-circular cross section portion includes at least one second pair of inclined surfaces which are symmetrical with respect to a line extending in a radial direction of said second rotary input shaft.

37. The lens barrel according to claim 29, wherein said manual operating ring includes a focusing ring, said lens group being moved along said optical axis to perform a focusing operation when said focusing ring is manually

rotated.

38. The lens barrel according to claim 29, wherein said manual operating ring includes a zoom ring, said lens group being moved along said optical axis to perform a zooming operation when said zoom ring is manually rotated.

39. The lens barrel according to claim 31, wherein the shape of each of said first non-circular cross section portion and said second non-circular cross section portion is a square in cross section.

40. The lens barrel according to claim 31, wherein the shape of each of said first non-circular cross section portion and said second non-circular cross section portion is triangular in cross section.

41. The lens barrel according to claim 29, wherein said lens barrel comprises an interchangeable lens barrel which is detachably attached to a camera body.

42. The lens barrel according to claim 31, wherein said first biasing device comprises a first compression coil spring fitted on said rotary input shaft, and

wherein said second biasing device comprises a second compression coil spring fitted on said rotary input shaft.

43. An interchangeable lens comprising:

a photographing optical system including at least

one movable lens group guided along an optical axis;

a mount ring a rear end of which is detachably attached to a camera body;

a drive shaft which extends parallel to said optical axis, and includes an orthogonal surface lying in a plane orthogonal to an axis of said drive shaft, a rear end of said drive shaft being coupled with a drive system provided in said camera body when said rear end of said mount ring is properly attached to said camera body;

a manual operating ring which is rotated by a rotation of said drive shaft via a gear mechanism, said movable lens group being moved along said optical axis by a rotation of said manual operating ring;

a hollow-cylindrical output gear having a cylindrical inner peripheral surface in which said drive shaft is fitted so that said hollow-cylindrical output gear can freely rotate on said drive shaft, and an outer gear portion which is formed on an outer peripheral surface of said hollow-cylindrical output gear to be concentric with said cylindrical inner peripheral surface, said outer gear portion serving as a part of said gear mechanism;

a non-circular cross section portion formed on said drive shaft to be adjacent to said orthogonal surface to form a plurality of accommodation spaces between said

drive shaft and said cylindrical inner peripheral surface;

a plurality of balls installed in said plurality of accommodation spaces, respectively; and

a biasing device for making said orthogonal surface and said plurality of balls come into pressing contact with each other,

wherein said non-circular cross section portion is shaped so that said rotation of said drive shaft is transferred to said hollow-cylindrical output gear via said plurality of balls, to which said rotation of said rotary input is given via said orthogonal surface, when said drive shaft is driven to rotate.